

The Causes of Black Stained Teeth in Children and Ways of Treatment

Karimi, M., D.M.D., B.S.

Department of Paediatric Dentistry, Sepideh Dental Clinic, Iran

***Correspondence to:** Dr. Karimi, M., D.M.D., B.S., Department of Paediatric Dentistry, Sepideh Dental Clinic, Iran.

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Abstract

The most common causes of blackening of teeth are caries or cavities that should be addressed as soon as possible. On the other hand, the blackening of the teeth may be the result of stains formation on their surfaces. Children's teeth cause distress and discomfort to the parents. This problem can occur for various reasons such as the use of iron drop, the application of some toothpaste and mouthwashes, infections, drug metabolism, and so on.

Different foods and drinks can leave colored spots on the teeth surfaces and make the teeth blacken. The main color of the teeth is largely influenced by the calcium in the outer layer of the tooth, which is known as enamel.

Over time, stains that remain by eating food and drinking can make the teeth yellow or gray. However, if the children's teeth are turned black, the parents should seek dental consultations to find out the main reasons. There are some prevention ways and the treatment plan which can be offered by the pediatric dentists.

Introduction

In these 22 years of pediatric dentistry practice, for most parents, the beauty of their children's teeth has been more important than other dental issues.

Blackening of the teeth can have many reasons that need to be investigated. Blackening of teeth can be a sign of destruction of the enamel and dentin area and creating a cavity in them, which should be addressed as soon as possible. Of course, the blackness of the teeth may be due to the presence of colors. For example, there are various foods and drinks that can leave a little bit of pigmentation and blacken the teeth.

In addition, there are other specifics, including the use of certain medications (Iron supplementation) [1], the use of tobaccos [2], infections, drug metabolisms, malnutrition, bleeding disorders, and developmental anomalies can be affected [3-6]. Some measures can be taken to prevent these black spots.

Treatment options can vary depending on the cause of the discoloration and may include: using proper tooth brushing and flossing techniques, avoiding foods and beverages that cause stains, applying composite veneers and finally using over-the-counter whitening agents by a dental professional.

What are the Main Causes?

One of the problems parents face is a change in the color of the teeth of their loving children, and the color of the teeth may be caused by various factors. We can divide these factors into two groups:

A- Extrinsic Factors :[7-9]

- Damage to the enamel
- Stains
- Sediments
- Regularly drinking dark colored beverages such as coffee and tea
- Liquid iron supplementation
- Use of some mouthwashes and toothpastes
- Tobacco use (common among adolescents in smoking and chewable forms)

One of the causes of black teeth in children is the drop of iron that they consume. The iron drop is an oral supplement which is routinely prescribed to children; however black tooth staining is one of the side effects of this supplement. The black stain is a ferric compound which is formed by the interaction of the saliva or sub-gingival cervical fluid between hydrogen sulfide and iron [10].

The dental enamel can be destroyed by the penetration of bacteria into the enamel structures. This destruction leaves on cavities; they have a dark appearance. This is very common in children who have very poor oral hygiene with the consumption of high contents of hydro carbonated foods and sweets.

Potassium permanganate mouthwash, which is used in patients with oral candidiasis, causes a violet-black stain [11].

Tobacco is consumed orally in forms of both smoking and chewable. Unfortunately, the smoking habit is increasing rapidly among the children which are one of the biggest threats to children's health. Tobacco stains usually are found on the enamel surfaces of smoker's teeth. These stains on children's teeth are observed on the buccal or lingual surfaces area which can be attached to the surfaces; they cannot easily be removed by tooth brushing [12].

B- Intrinsic Factors: [8,13]

Although most contributing factors of black stains in children are due to extrinsic factors, in some cases, intrinsic factors can cause dark discolorations.

A number of metabolic diseases and systemic factors may affect the color changes including black color in children's teeth which are listed below.

- Infections (e.g. rubella, measles)
- Metabolism of the drug (tetracycline, fluoride)
- Malnutrition
- Bleeding disorders (sickle cell anemia, thalassemia)
- Growth anomalies (amylogenesis and dentinogenesis imperfecta)

In more severe fluorosis, the teeth can become pitted and have brown, gray or black spots. These stains can cause acute embarrassment to a child and significant teasing from peers.

In one case report study, "The remarkable side-effect of *Minocycline* on the oral cavity is the singular occurrence of "black bones", "black or green roots" and blue-gray to gray hue darkening of the crowns of permanent teeth." [14]

One of the causes of Enamel Hypoplasia includes malnutrition during pregnancy, and vitamin deficiencies, particularly vitamins A, C, and D [15,16]. In rare cases, the entire tooth may have a dark brown discoloration [17]. A blue-brown discoloration of teeth was also seen in patients with dentinogenesis imperfecta [17].

Blood products can cause discolorations in teeth. An example of that is trauma to an incisor tooth. When a dental trauma happens, the erythrocytes break down, and the released iron will combine with hydrogen sulfide to form iron sulfide, which has a bluish black color [18].

Yellow-green discoloration was found in patients with sickle cell anemia and thalassemia because of blood pigments deposition [19].

Actinomyces, Porphyromonas Gingivalis, and Prevotella Melaninogenicus have been found as the predominant microorganisms involved in black staining [7,20].

Chromogenic bacteria have also been reported in brown and black tooth discoloration, especially in pediatric patients with good oral hygiene [8,21,22].

Ways of Prevention

Black teeth of children cannot be preventable due to factors such as weakness of the enamel due to genetics, childhood disease and damage to the teeth and gums due to an accident, but parents can follow some suggestions which are given by pediatric dentists to protect children's teeth.

Parents should evaluate the brushing habits of their children. If they are not following the right techniques, parents should help them with tooth brushing. Regularly visiting a pediatric dentist can lessen the possible treatments [23].

If the kid is hungry, mothers should not breastfeed the baby at bedtime so that they have time to clean the babies' teeth before they are ready to go to bed [24]. Parents should not allow toothpaste to be used until the baby learns how to spit out the toothpaste.

The iron supplement should be diluted in some juice or water, so it prevents tooth staining. When an iron supplement is added to orange juice the vitamin C makes it easier to absorb iron. [25] But never add the supplements to milk, because milk makes it difficult to let iron to be absorbed properly [26-28]. Of course, parents can try to use less diluted iron supplementation.

Suggested Treatments

Usually treating black teeth at home is not possible. There are several home-based bleach kits that may help reduce the color of the teeth, but black teeth usually require professional treatment and should be referred to the dentist.

The presence and penetration of bacteria in the grooves or deep multiple surfaces of the teeth cause decay [29]. Color changes due to decay are observed at various stages. In some cases, this change in color (in both the early stages and the onset of decay) also occurs on the teeth surface, especially in the grooves. In this case, caries might be stopped by taking care of oral hygiene (regular brushing with fluoride-containing toothpaste, using fluoride mouthwash and application of fissure sealants). Topical fluorides are effective at preventing caries. A series of reviews found that topical fluorides (varnish, gel, mouth rinse and toothpaste), used either individually or in combination, significantly reduced caries in children and adolescents [23,30-34].

A study shows the caries-preventive effect of fissure sealants that sealed permanent molar teeth had over 50% less caries than unsealed teeth after 4.5 years [35,36]. In the event of decay's progression, caries must be removed and the tooth has to be restored without any delay or procrastination.

When enamel is affected by black spots stains, only specialized treatments can eliminate black spots and restore the natural color of the tooth [7]. Tooth scaling and rotary polishing with an abrasive prophylactic paste and air jet polishing, is done only by the dentist in the office. Tooth polishing is a dental procedure which

performed as a part of oral prophylaxis in dental practices. It has been used to describe the professional removal of soft deposits and stains from the tooth surfaces. During polishing, plaque, biofilm, extrinsic stains and acquired pellicle are removed by prophylaxis paste [37].

Nowadays, air-powder polishing devices are preferred by some dentists compare to the conventional rubber cup polishing paste systems. For supra-gingival plaque removal, this device can reach the surfaces that are inaccessible by a rotary device [38-44].

Air-powder polishing is used with a specially designed hand piece which is called Prophy-jet. It delivers air-powder slurry of warm water and sodium bicarbonate for polishing. It is very effective for the removal of extrinsic stains and soft deposits. There are several contraindications for air polishing. These especially include children with sodium restricted diet, hypertension, respiratory illnesses, infectious diseases, renal insufficiency, Addison's or Cushing's disease, and some medications (Mineral corticoid steroids, anti-diuretics, potassium supplements) [45].

There are a number of precautions that clinicians should be aware of when deciding if tooth polishing is indicated. Precautions include; teeth without existing stain, newly erupted teeth, tooth decalcification, hypocalcification, hypoplasia, demineralization, and rampant caries [46]. Areas with exposed root surfaces should also be avoided as well as, areas with tooth sensitivity and gingival inflammation. Tooth polishing should also be avoided in the case of allergies and communicable diseases.

If the tooth pulp is damaged, the root canal therapy would be performed. If the pulp tissue is severely damaged and there is no hope of a cure, unfortunately, the tooth has to be extracted and a space maintainer has to be replaced so that we should able to preserve the space area for the permanent tooth eruption.

Almost all black stains can be cleaned and removed by the dentist. Sometimes, it is necessary to use a laser method to tooth whitening. Some black or brown stains can be treated with bleaching, but most pediatric dentists will not recommend bleaching for children, possibly as a treatment [47].

If the stains are severely penetrated into the teeth so that cannot be removed without any damage to the enamel, the composite veneers can be the substituted method [48].

Applicable Home Remedies

In this section, we decided to apply and provide a number of recommendations. It should be noted these remedies do not apply as a curative procedure. They are merely suggested to reduce the stains.

Diet and Eating Vegetables

A healthy diet is very important. Nutrients are necessary for the health of the tooth. A good diet prevents the formation of black stains. It is better not to eat fatty foods because they produce bacteria. Sweets are also not suitable. Fruits and vegetables are suitable for preventing caries and increasing oral and dental health. Grandma recommends taking apple, carrot and green leafy vegetables daily. Do not overlook the beans and nuts because they contain nutrients that are needed for the health of the tooth.

Gargling Baking Soda

Baking soda has natural whitening properties, which is an ingredient in commercial toothpaste. Its mechanism of action is to prevent bacteria from growing in the mouth after each tooth brushing [49-51]. Before brushing, add some baking soda to the toothpaste. It has an abrasive feature and is suitable for removing tooth black spot. Parents can also make a mixture of water and baking soda and let the children gargle twice a week.

Lemon Juice and Water

Mix some lemon juice with water, and then apply lemon juice on the black teeth surfaces directly. Another way is to mix salt with lemon and apply it on the tooth. Then rinse after a few minutes. Needless to say, this method should not be used every day. For reusing this method, there should be an interval time of one week due to possible damage to the enamel structures.

Paste of Strawberry, Baking Soda, and Salt

Some believe that Malic acid found in strawberries will remove discoloration on the teeth surfaces, while the baking soda will polish the stains [52]. Make a paste by mixing strawberry, baking soda, and salt. Vitamin C and Malic acid present in the strawberry will eliminate the black stain. Rub the paste for 5-10 minutes on the area. Polish it once every month on stained teeth for a few minutes. Do not use this method very often or it will erode the tooth enamel [53,54].

Apple Cider Vinegar

The antibacterial property of apple vinegar [55] makes it useful for cleaning the mouth and whitening the teeth which eliminates the dental stains that affect the tooth enamel [56]. Mix a teaspoon of apple vinegar with a glass of water and gargle it twice a week. The acetic acid in vinegar has the potential to cause enamel erosion [57], consequently, the apple vinegar should not be used every day.

Conclusion

To finish this article, we should point out the black stained or discolored children's teeth can be caused by many sources. Fruit juices, medicines, vitamins, genetic factors, and even harmless bacteria may cause all the stains along the teeth and the gum line. Fortunately, if the blackness of the primary teeth is related to the iron supplement, the permanent teeth that replace them would not have any signs of stains. When permanent teeth develop, there is no need for iron supplementation, and the child will no longer have tooth discoloration problems.

In addition, there are many reasons for teeth discoloration of primary teeth. Tooth damage and poor enamel structure can change the color of both permanent teeth and primary teeth in children.

To prevent black spots on teeth in children, the best option is having good oral hygiene. If factors such as genetics, the use of certain medications and the presence of certain diseases do not cause black stained teeth, parents can prevent stained teeth with proper oral hygiene and proper diet.

The best way to treat the stained black teeth in children is to start tooth scaling and polish them for the external surface of the tooth. But the most appropriate option is to visit an experienced and expert pediatric dentist for a dental examination. It's best to follow all the dentist's guidelines to achieve the best results.

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